THE EFFECTIVENESS OF WEB-BASED FOOD ALLERGY TRAINING AMONG RESTAURANT MANAGERS

Yee Ming Lee, M.S.
Department of Hospitality Management and Dietetics
Kansas State University

and

Junehee Kwon, Ph.D., R.D.
Department of Hospitality Management and Dietetics
Kansas State University

ABSTRACT

Many food allergic reactions occurred in restaurants indicating employee food allergy training is necessary. The hospitality industry adopts web-based training method as it is beneficial. The objective of the study is to identify the effectiveness of web-based food allergy training on knowledge, self-efficacy, and behavioral intention serving customers with food allergies. Participants will include 100 managers from independent restaurants in Kansas. A web-based training module will be developed and pilot tested. A quasi-experimental design (intervention and control groups) with a pre- and post-test will be used to assess knowledge scores. After six month, another questionnaire that assesses participants' retention of food allergy knowledge, self-efficacy, and behavioral intention to serve customers with food allergies will be administered. Descriptive statistics, MANOVA, MANCOVA, Chi-square analyses, logistic regression, and regression will be employed for statistical analysis. Results of the proposed study will provide insights about using web-based training as future educational tool.

Keywords: Web-based training, food allergy, restaurant managers, knowledge, self-efficacy, behavior intention

RATIONALE AND PURPOSE

Over 70 billion meals are served in American restaurants annually (National Restaurant Association [NRA], 2009). With an increasing number of customers with food allergies (i.e., 12 million adults and 3 million children, as of 2010), providing allergen-free food to this population has become more challenging (Food Allergy and Anaphylaxis Network [FAAN], n.d.). Most of the allergic reactions happened in restaurants and non-commercial foodservice establishments (Furlong, McMorris, & Greenhawt, 2008). Factors leading to allergic reactions include cross-contact, hidden allergens, miscommunications between/among customers and restaurant staff, and lack of restaurant managers' knowledge about food allergy (Mandabach, Ellsworth, VabLeeuwen, Blanch, & Waters, 2005). High training cost, high turnover rate, time constraints, language barriers, and indifferent attitudes of restaurant staff were identified as barriers to food allergy training (Abbot, Byrd-Bredbenner, & Grasso, 2007).

Workplace training could reduce errors and improve skills (Bassi, 1994). In addition to the traditional training methods, more industries are using technology-assisted training in their organizations, and one of them is web-based training. The benefits of using web-based training

have been studied. From the economic perspective, web-based training is cost effective compared to other training methods (Sigala, Airey, Jones, & Lockwood, 2001). Even though the copy of the materials might be costly but the reproduction is easy. For instance a cost analysis case-study conducted at Bell Online Institute (BOLI), established by Bell Canada to train its in-house employees via a web-based method concluded that cost saving of web-based over the traditional classroom delivery method was $632 per attendee (Whalen & Wright, 1999).

Furthermore, the content of the training materials could be modified easily compared to the printed materials. Some training programs require the participants to enter their identification information, therefore ease the process of documentation and record-keeping (Hu, Nelson, Braunlich, & Hsieh, 2003). Web-based training is convenient, promises a consistency in the diffusion of knowledge (Brown, 2000), and provides a chance of self-pace learning (Strother, 2002). Web-based training is also more flexible, portable, allows better scheduling of training sessions (Wolfson, 1986), and could be delivered in an on-demand manner (Zhang, Zhao, Zhou, & Nunamaker, 2004). Web-based training is sometimes the preferred or only alternative training method if the trainees are scattered in different or remote locations (Chatzoglou, Sarigiannidis, Vraimaki, & Diamantidis, 2009).

On the other hand, web-based training also has some drawbacks. Learning process of individuals with little computer literacy or technical knowledge could be interrupted in web-based training since they are unfamiliar with this new training method (Hu et. al, 2003). Web-based training also creates nervousness, disappointment, and confusion among the learners and leads to decreased in work motivation (Zhang et al., 2004). The training session could be time consuming if the learners want to locate or omit a particular chapter of the training materials. With web-based training, the learners might be deprived of chances to ask question and receive feedbacks since the materials are pre-made in asynchronous manner (Zhang et al., 2004), and therefore, human contact could be diminished. In addition, web-based training is not suitable to be used to teach soft-skills, such as leadership and customer services since physical presence of an instructor is necessary to conduct these skills (Driscoll, 1999). In addition, substantial resources are needed to initiate the web-based training and set up the computer and network system, as well as maintain the functionality of the webpage (Harris & Cannon, 1995; Hu et al., 2003). Hence, the operating cost elevates.

The hospitality industry has started to adopt web-based training method (Harris & Bonn, 2000). However, there is no study conducted to investigate if web-based training is feasible to improve knowledge and attitudes regarding food allergies of the restaurant employees. Therefore, the purpose of this study is to explore the effectiveness of the web-based food allergy training in restaurants. The specific objective of this study is to identify the effectiveness of web-based food allergy training on knowledge, self-efficacy, and behavioral intention to serve customers with food allergies.

Hypotheses
Web-based food allergy training will
(1) Increase restaurants managers' food allergy knowledge.
(2) Enhance self-efficacy of restaurant managers to serve customers with food allergies.
(3) Increase behavioral intention of restaurant managers to follow specific guidelines when serving customers with food allergies.

METHODOLOGY

Participant selection

The population includes managers of independent licensed restaurants in Kansas. There are 4998 restaurants and bars in Kansas and approximately 3900 of them are independent restaurant establishments. Independent establishments with limited food preparations such as the convenience stores will be removed before random sampling. From the list, 400 establishments will be randomly selected for the sample (approximately 10% of total population).

Instrument development

The training modules will be developed based on two previous studies of customers with food allergies and hospitality management and dietetics students regarding dining out with food allergies (Kwon, Lee, & Sauer, 2010a, 2010b). Consumers with food allergies perceived inadequate food allergy knowledge, lack of seriousness in meeting customer's special requests, miscommunication between front and back of the house employees, cross-contact, and unreported ingredients as factors led to allergic reactions (Kwon et al., 2010a). Future restaurant managers (i.e., students in hospitality management or dietetics) indicated that customers not informing servers about their food allergies would cause the reactions (Kwon et al., 2010b). Food allergy training needs identified through these two studies will be used to develop web-based training modules including common food allergens, symptoms of food allergies and anaphylaxis, actions taken during an allergic attack, label reading and identification of hidden allergens, ways to handle food allergens, and effective communication between employees and customers. The average time for completing the training will be 45-60 minutes. The Flesch Reading Ease Readability Formula will be used to identify the reading comprehension level of each module, with desirable readability test score of 60-70 (fairly easy) (Flesch, 1948).

A quasi- experimental design will be used to evaluate the effectiveness of the program. Pre- and post-tests will be developed based on the training content and include 30 knowledge, attitude, and self efficacy questions. Self efficacy is how competent and confident one is in dealing and coping with demanding or stressful situation (Schwarzer, 1994, p. 410). A five-point Likert scale, as 1 being very unconfident to 5 being very confident will be used to assess participants' self-efficacy to serve customers with food allergies. Behavioral intention is measured using five-point intention scale, ranges from "definitely would not" to "definitely would". The following demographic characteristics will be collected to understand our subjects and compare results among groups: restaurant size and number of meals served, number of employees, classification of restaurant, current food allergy training and person in charge if trainings are given, and characteristics of the managers (i.e., gender, age, educational level, years in the restaurants industry, and food allergies training received). To establish the test-retest reliability of the knowledge questionnaire, the Pearson conduct moment correlation test will be used.

Pilot study

The training modules will be pilot tested with 15 HMD students at a university located in Midwest. Only students with working experience in a foodservice establishment will be eligible to participate. Inter-item reliability of attitude measures will be measured using Cronbach's alpha with a goal ≥ 0.8. The instrument will be revised based on the feedbacks.

Data collection
The participants will be randomly assigned to intervention or control groups. The control group will receive other food safety training. An instructional video and other materials will be available online to familiarize participants with the training systems and each participant will assign themselves a username and password to access the training materials. The training site can be accessed multiple times. The participants will have two weeks to complete the entire modules. Each module is followed by a quiz that must be taken prior to proceeding to the next chapter. Post-test will be administered after completing all modules and again six month later to assess retention of food allergy knowledge, self-efficacy, and behavioral intention. Gift cards ($30) will be provided as an incentive for completing the modules and follow-up.

Data Analysis
Data will be analyzed using SPSS software version 17.0. Descriptive statistics such as frequency, means, and standard deviation will be computed to summarize the data. Potential baseline differences between the control and intervention groups will be assessed by MANOVA on the pre-test scores. If baseline differences are found, MANCOVA will be conducted to control them. After the intervention, a MANOVA will be conducted to test for differences between intervention and control groups on the post-test scores. Chi-square analyses and logistic regression will be used to examine potential differences between the intervention and control groups on individual knowledge items. Follow-up knowledge retention scores will be calculated for each dependent measure by subtracting the post-test scores from the six-month follow up test scores to control covariance. Regression will be used to assess the relationship between knowledge, self-efficacy and behavioral intention. Statistically significance will be determined with $p<0.05$.

Limitation
The participants in web-based group might access to additional food allergies information other than the course materials hence obtain a higher score. The sample will be recruited from Kansas, so the results might not be generalized to other states. Computer anxiety, the feeling of intimidation and nervousness, might affect the tests results. Web-based training is not accessible to certain populations which lead them to not participate or drop out from the study.

REFERENCES

Abbot, J. M., Byrd-Bredbenner, C., & Grasso, D. (2007). "Know before you serve": Developing a food-allergy fact sheet. *Cornell Hotel and Restaurant Administration Quarterly, 48*, 274-283.

Bassi, L. (1994). Workplace education for hourly workers. *Journal of Policy Analysis and Management, 13*(1), 55-74.

Brown, L.K. (2000). Web based training. *ERIC Digest*, 218, 1-2. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.112.1210&rep=rep1&type=pdf

Chatzoglou, P. D., Sarigiannidis, L., Vraimaki, E., & Diamantidis, A. Investigating Greek employee's intention use web-based training. *Computer and Education. 53*, 877-889.

Driscoll, M. (1999). Web-based training in the workplace. *Adults Learning, 10* (4), 21-25.

Flesch, R. (1948). A new readability yardstick. *Journal of Applied Psychology, 32*, 221-233.

Food Allergy and Anaphylaxis Network. (n.d.). *Food allergy facts and statistics*. Retrieved from http://www.foodallergy.org/downloads/FoodAllergyFactsandStatistics.pdf

Furlong, T. J., McMorris, M. S., & Greenhawt, M. J. (2008). Self-reported allergic reactions to peanuts and tree nuts occurring in restaurants and food service establishments. *Journal of Allergy and Clinical Immunology*, *121*, S248

Harris, K. J., & Bonn, M. A. (2000). Training technique and tools: Evidence from the foodservice industry. *Journal of Hospitality & Tourism Research, 24*, 320-335. DOI:10.1177/109634800002400302

Harris, K. J., & Cannon, D. F. (1995). Opinion of training methods used in the hospitality industry: a call for review. *International Journal of Hospitality Management, 14*, 79-96.

Hu, B. A., Nelson, N. C., Braunlich, C. G., & Hsieh, Y. (2003). The future of internet based training in the lodging industry. *Journal of Human Resource in Hospitality Industry & Tourism, 2*, 93-112. DOI: 10.1300/J171v02n02_06

Kwon, J., Lee, Y. M., & Sauer, K. (2010a). *Food Allergies in Restaurants: Knowledge, Attitudes, and Behaviors of Consumers with Food Allergies*. Manuscript in progress.

Kwon, J., Lee, Y. M., & Sauer, K. (2010b). *Food Allergies in Restaurants: Knowledge, Attitudes, and Behaviors of Hospitality Management Students*. Manuscript in progress.

Mandabach, K. H., Ellsworth, A., VabLeeuwen, D. M., Blanch, G., & Waters, H. L. (2005). Restaurant manager's knowledge of food allergies: A comparison of differences by chain or independent affiliation, type of service and size. *Journal of Culinary Science & Technology*, *4*, 63-77.

National Restaurant Association. (2009). *2009 Restaurant Industry FORECAST*. Retrieved from http://www.restaurant.org/pdfs/research/2009forecast.pdf?CFID=165374224&CFTOKEN=55840307

Schwarzer, R. (Ed). (1992). *Self-efficacy: Thought control of action*. Washington, DC: Hemisphere Publishing Corp.

Sigala, M., Airey, D., Jones, P., & Lockwood, A. (2001). Multimedia use in the UK Tourism and Hospitality Sector: Training on skill and competencies. *Information Technology & Tourism, 4*, 31-29.

Strother, J. (2002). An assessment of the effectiveness of e-leraning in corporate training programs. *International Review of Research in Open and Distance Learning, 3*(1), 1-17.

Whalen, T., & Wright, D. (1999). Methodology for cost benefit analysis of web-based tele-learning: Case study of Bell Online Institute. *The American Journal of Distance Education, 13*, 25-43.

Wolfson, J. G. E. (1986). Computer-based learning in adult education: a South African case study. *Programmed Learning and Educational Technology, 23*(1), 76–83.

Zhang, D., Zhao, J. L., Zhou, L., & Nunamaker, J. F. (2004). Can E-learning replace classroom learning? *Communication of the ACM, 47*(5), 75-79.